

THE CLIMATE OF NORTHERN CANADA

DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES,  
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## THE CLIMATE OF NORTHERN CANADA

The belief that all northern Canada is a land of perpetual cold and snow is about as sound as the generalization that all newsmen have ulcers and spend their time solving crime for the local police department.

There are wide climatic variations in the million and a half square miles lying north of Canada's provinces. The differences between Yellowknife, on the north shore of Great Slave Lake and Alert, Canada's most northern community, are about as great as between Ottawa and Los Angeles. Some of the lowest temperatures in North America are not, surprisingly, generally to be found in the Canadian north. But, on the other hand, higher temperatures have been recorded in the Northwest Territories than in the cities of the lower Great Lakes. The winters are relatively long and hard, but over most of the Northwest Territories the annual snow fall is less than in most of the northern United States.

### Lines on the Map

The first point to note about northern climate is that latitude seems to have very little to do with it. The temperatures are pretty much the same at the mouth of Mackenzie River and in the north-east corner of Manitoba, 600 miles to the south. The line that is important is the treeline, which runs roughly diagonally between these two points. The country north of it is generally defined as Arctic and south as the sub-Arctic. The treeline almost coincides with the 50 degree July isotherm since generally trees will grow as long as the mean temperature of the warmest month of the year is 50 degrees

Fahrenheit.

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THE CLIMATE OF NORTHERN CANADA  
Climatically the Arctic Circle means nothing. In Canada

most of it is north of the treeline, and therefore deep in the Arctic.

The belief that all northern Canada is a land of perpetual  
But in the west the Arctic Circle runs through sub-Arctic country.

And snow is about as sound as the generalization that all northern  
All the Arctic Circle means is that on this line, on one day each  
year, the sun does not rise and on one day it does not set. Obviously,

as one goes north from that Line the number of sunless and of

nightless days, both increase until one reaches the Pole at which

half a score miles lying north of Canada's provinces. The difference  
point there are, theoretically, one hundred and eighty-three days

of sunlight and one hundred and eighty-three nights, more or less.

This is particularly confusing in view of the general doubt which

exists as to what time it is at the North Pole.

The question of time raises another point, which may

be a little remote from climate. Since the accepted time zones of

North America run along the meridians of longitude which all join

at the North Pole, the time zones in the Arctic are more compressed,

that is, their eastern and western boundaries are a great deal

closer together than on, for instance, the 49th parallel. Travellers

flying from east to west therefore find themselves retarding their

watches rapidly and apparently gaining immense quantities of time

which can be used only by burning the candle at both ends. If

they then go back from west to east by a more southerly route,

they lose the time much more slowly than they gained it in the

Arctic. This is generally supposed to be the explanation of why

everyone in the Arctic gets so much done in so little time, and

people at the North Pole in no time at all.



There is another climatic line on the map worth looking at: this is the limit of permafrost. This line too follows a vague diagonal, rather than a parallel of latitude, though it is a good deal farther south than the tree line in most of its parts. The entire Arctic, therefore, and a considerable strip of the sub-Arctic, is permanently frozen.

The surface soil thaws each summer time to varying depths, depending upon the area and the kind of summer weather in it. The existence of permanently frozen ground does not inhibit plant growth. It is, in fact, a method of conserving moisture. The soil near the surface merely freezes and thaws much as it does in southern Canada or the northern United States. The real interest of the permafrost line is that it is approximately there that the most difficult problems of northern building begin to arise.

### Temperature

It is rather cold in winter. The mean daily temperature in January at Frobisher Bay, for instance, is 18 degrees below zero. At Resolute on Cornwallis Island it is 29 below. Even in the much more settled parts of the Territories -- what is usually known as the Banana Belt -- the January temperatures are low. At Yellowknife it is about 26 below zero. At Fort Smith 22 below, at Whitehorse, the capital of the Yukon, about 13 below. This makes them all colder than Winnipeg whose average January temperature of 3 below gives it the reputation of being the coldest major city in Canada.

In the Arctic though, it's not the cold, it's the humidity. Temperatures of 10 or 20 degrees below zero may seem no worse than 5 or 10 degrees above in the moister air of the south. When



one is properly dressed, as all residents are, the cold is rarely uncomfortable, provided there is not a wind. The effect of cold and wind together can, however, be thoroughly brutal.

In summer it is a different story. Fort Smith has known a temperature of 103 above zero. That, by the way, is higher than has ever been experienced by the residents of Windsor, Ontario, which are on virtually the same latitude as the northern tip of California.

The average July temperature of Fort Smith is just about the same as Edmonton (62 degrees). The average July temperature in Yellowknife is 60 degrees, about four degrees warmer than Whitehorse or Aklavik. Swimming and other traditional summer sports are popular near Yellowknife. Up in the High Arctic in summer, people are inclined to other amusements -- it is said that no Eskimos are able to swim. Even in the Arctic islands, however, daytime temperatures in the 70's are not uncommon, and for a short while the thousands of glacial lakes warm up rapidly.

#### Sunshine

The spring and summer periods may not have either the length or intensity of heat in the summer that we are accustomed to in the south, but they do have much more light. People on the DEW Line, for instance, could certainly read their daily newspapers, if they had them, out of doors at midnight from mid-June to mid-July. The number of hours' sunlight does a good deal to make up for the lower temperatures, and shorter frost-free period. Along the Mackenzie Valley particularly, the residents can take advantage of the long days to grow vegetables for human consumption. In degree of growth per day or week, they certainly rival conditions



anywhere else in the country. As a result, the north produces quite remarkably formed fruits and vegetables and even garden flowers -- for instance delphiniums seven feet high. In the High Arctic some people have taken advantage of the long light to build small greenhouses which alone can defeat the problem of frost and the short growing season. The results in terms of fruit and vegetables which they obtain are quite remarkable. In short then, the limitation of the climate is in the growing of grains, at least until the development of varieties which can mature in a much shorter frost-free period than are at present in use. The climate, however, will permit the growth of some food stuffs, enough to supply part of the needs of the local population. Especially in the Mackenzie Valley where the greatest concentration of population in the Northwest Territories is now found, there is sufficient good soil for cultivation, an estimated two to two and a half million acres. The potential of this land in the northern climate is increasing year by year with further experience in northern growth and research in the experimental stations.

#### Precipitation

A large part of the Canadian north is one of the largest deserts in the world, if one uses the word desert to mean an area of little rain or snow. Were the temperature to rise sufficiently to melt the permafrost, most of the Barrens might become as barren as the Sahara or Gobi. Over most of this region the annual total precipitation is from 5 to 10 inches, with slightly more than half occurring as snow. This is a factor which on the whole is in favour of northern development. Low precipitation is, of course,



a detriment to plant growth, but it is unlikely that most of the barren land will ever have importance as a source of food supply. Heavy precipitation, especially heavy snowfall can be a considerable disadvantage in economic development. Snow clearance in communities can be expensive, it is a hazard and an expense to the maintenance of air fields and, much more, to roads or railways. In the matter of snowfall, therefore, the north is in a much better position than either northern Ontario or the northern United States. If, as residents of the Northwest Territories hope, within the next few years, a railway line is pushed from the south into the Mackenzie Valley one problem which it will not face is snow clearance.

#### Climate as an Economic Problem

Climate is not a serious problem in the economic development of the north. It may be a psychological problem, partly because of the public misconception about the nature of northern climate. The only real problem about cold in the north is paying for it. Obviously the relatively low temperatures do create added expenses, expenses for insulation for homes, expenses for clothing, expenses for fuel. These, however, are economic, rather than physical problems. The encouraging fact is that with the growing world demand for the mineral resources of the north it can absorb the added costs which arise from meeting the cold if other more important problems, such as the provision of adequate transportation, are overcome.

Kipling once called Canada "Our Lady of the Snows" and Voltaire once referred to our country as "a few acres of snow". Anyone who has experienced heat waves in southern Ontario, Quebec



or the prairies laughs bitterly at their assessment. As the years go by, fewer and fewer tourists are bringing their skis across the border in July.

The north is still the land of igloos in the minds of many people, but as more visit it and public information spreads, the misconceptions there, too, will disappear. The climate is certainly not Californian, but neither is it unbearably cold. The climate is no barrier to the growth of population or economic development. It does require special preparations for the winter life, but July visitors to Yellowknife will feel foolish if they have left their bathing suits behind.

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